CLAIMS:

1. An optical coherence tomography system comprising

- an optical source to emit an optical beam
- a sample space
- a photodetector
- an interferometer set-up including
  - a reference reflector and
  - a beam splitter-combination arrangement to
    - split the optical beam into a reference beam to the reference reflector and a sample beam to the sample space and to
    - combine a reflected beam from the reference reflector with a returning beam from the sample space on the photodetector, wherein
  - the optical source has an emission wavelength in the range of 1.6μm to2.0μm, in particular having an infrared emission predominantly at a wavelength of 1.8μm associated with a transition between an upper energy level and a lower energy level and
  - the optical source comprises an excitation system which generates stimulated emission from a pump level to the upper energy level.

2. An optical coherence tomography system as claimed in Claim 1, wherein the optical source includes a Tm-doped fibre placed in an optical cavity of cavity reflectors facing one another.

3. An optical coherence tomography system as claimed in Claim 2, wherein the cavity reflectors are anti-reflex coated for a wavelength range of 760nm to 810nm.

4. An optical coherence tomography system as claimed in Claim 2 or 3, wherein the cavity reflectors have a high-reflectivity (coating) for the wavelength range 2.2μm to 2.4μm.

5. An optical coherence tomography system as claimed in Claim 2,3 or 4 wherein the cavity reflectors have a high-reflectivity (coating) for the wavelength range 2.2μm to 2.4μm and/or for the wavelength range 1.40μm to 1.5μm.

6. An optical coherence tomography system as claimed in Claim 2, wherein the optical cavity has reflectivities less than 0.04 for the wavelength range of 1.6-2.0μm.

7. An optical coherence tomography system as claimed in Claim 6, wherein

- an input cavity reflector has a high reflectivity (coating) for the wavelength range 1.6μm to 2.0μm and
- an output cavity reflector has a low-reflectivity (coating) for the wavelength range 1.6μm to 2.0μm.

8. An optical amplifier comprising

- a Tm-doped fibre in an optical cavity of cavity reflectors facing one another, wherein
- the cavity reflectors have an antireflex coating for the wavelength range of 1.6μm to2.0μm, and in particular are anti-reflex coated for a wavelength of 1.8μm.

9. A Tm-doped fibre having a fibre core extending along a longitudinal axis of the fibre and having a double cladding surrounding the fibre core.